REMARKS/ARGUMENTS

I. Claim Rejections Under 35 U.S.C. § 102

A. The Examiner rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by British Patent GB 2035602 to Pollak. Applicant respectfully traverses this rejection.

The Examiner characterizes the reference as reciting "the photolithographic steps to form textured or relief images on a surface." The Examiner further characterizes the reference as providing prototype (ring), forming a layer of photoresist, masking and exposure to a pattern and developing the resist to form the pattern. The final pattern may be used as a master mold to form duplicates."

Applicant argues that the Examiner's characterization is not entirely correct. In the reference, a ring (suitable for metallic etching) is coated with a resist composition. Portions of the resist composition are exposed to light while other portions are masked. After exposure, the film or emulsion is removed carefully to avoid damaging the resist layer. The ring is etched (by a metal etching process) to form an indented image/design on the ring. It is the design *etched into the ring* that provides the master pattern.

Claim 1 is directed toward a *raised feature* on a surface of a prototype model. Additionally, none of the other examples disclosed in the reference provide all the elements of claim 1. Further, claim 1 has been amended to include the limitation of providing a model made by a stereolithography process. The reference teaches a ring able to be etched by a metal etching process. Applicant's specification defines stereolithography as a "3-dimensional printing process that produces a solid plastic model." Therefore, claim 1 is not anticipated by the cited reference to Pollak.

B. Claim 1 was further rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,914,004 to Kohler et al.

This reference teaches a process for the production of relief structures by irradiating a two-layer system through a copying layer or mask. Areas not exposed to irradiation are removed by washing in a suitable solvent, leaving relief structures on the substrate. However, the reference does not disclose or claim providing a stereolithography model as the base to which a raised feature is added. Applicants have invented a method for rapidly providing a prototype model that includes complex surface patterns.

Since the cited reference does not provide all the elements of claim 1, the claim is not anticipated by the reference.

II. Claim Rejections Under 35 U.S.C. § 103

A. The Examiner rejected claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,397,683 to Roland in view of U.S. Patent No. 4,929,402 to Hull. Applicant respectfully traverses this rejection.

The reference to Roland does not provide teaching concerning the use of a model formed by a stereolithography process. Further, the reference does not suggest the use of an SLA model. Rather, the reference teaches a substrate having a photosensitive layer attached thereto available from a commercial source and known as "PRINTIGHT."

The reference to Roland does not teach or suggest that the process is used to form a prototype plastic model as in the instant invention. Therefore, there is no suggestion to apply the teachings of the Roland reference to an object formed according to the reference to Hull as the Examiner suggests.

Further the reference to Roland teaches applying a decorative coating to the photosensitive layer prior to adding the photo emulsion layer. Following step 11, the image is inspected for proper color. If necessary, steps 2-11 are repeated, meaning that another layer or decorative coating is applied prior to adding an additional photo emulsion layer.

In applicant's claims 2-3, the step of coating the surface with a photo resist provides a building up the photo resist in layers (claim 2) with sufficient drying time between the layers (claim 3). The combination proposed by the Examiner does not teach or suggest applicant's invention.

The reference to Roland teaches using a commercially prepared substrate. The first application of the photo emulsion layer in this reference occurs at step 5. Step 5 follows the application of a pre-coat powder. Therefore, this reference actually teaches away from cleaning the surface before applying the photo emulsion layer. A combination with the reference to Hull does not cure the inadequacy of the Roland reference as applied to applicant's claims.

The Examiner states that Roland teaches applicant's claim 5. However, the process disclosed in Roland begins with a commercially prepared substrate. Roland adds a decorative coating and a prep-coat powder before applying a photo emulsion. After exposure, applying emulsion developer, drying, applying ink developer, the object is inspected for color. At this point, the process in Roland may be repeated. The repetitive process does not include an immediate application of photo resist. Rather, the process repeats starting with addition of more decorative coating.

Further, the reference to Roland teaches that in step 12, the hardened emulsion layer 38 over the latest decorative coating layer is removed by a photo emulsion image remover. This step of removing the hardened photo resist layer teaches away from applicant's invention.

Therefore, applicant's invention is not obvious in light of the cited references. The references are not properly combinable and Roland teaches away from the claimed invention.

B. Claims 2-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pollak in view of Hull.

As provided above, Pollak does not teach forming a model with a raised feature. Pollak also requires that the substrate be susceptible to etching in a metal etching process. Therefore, it is improper for the Examiner to combine the references and modify them to meet Applicant's claims.

III. New Claim

Claim 8 has been added to the instant application via this Amendment A. Claim 8 finds its support in the specification as originally filed at page 6, lines 9-10.

None of the cited references teach or suggest adding additional photo resist in order to soften the edges of a raised feature. On the contrary, the reference to Pollak discloses the desirability of sharply etched lines. The reference to Roland teaches removing the outermost hardened layer of photo resist. Hull does not teach providing raised images on a SLA substrate through a photo resist process.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Please cancel claim 6.

Please amend claim 1 as follows:

1. A method for providing a raised feature on a surface of a prototype model characterized by the steps of:

(a) providing a model formed by a stereolithography process, the model having at least one surface on which to provide a raised feature;

(b) coating the surface with a photo resist to a predetermined thickness;

(c) providing means for preventing exposure of a first portion of the photo resist to a radiation source while allowing exposure of a second portion of the photo resist wherein the second portion of the photo resist provides the raised feature;

(d) exposing the surface to a radiation source to chemically alter the second portions of the photo resist; and,

(e) removing the first portion of the photo resist from the surface while leaving the raised feature formed by the exposed photo resist on the surface.

Please add claim 8 to the instant application as follows:

--8. The method of claim 1 further characterized by the step of:

softening an edge of said raised feature by over-coating said edge with additional photo resist.--

CONCLUSION

In response to the Office Action dated October 2, 2002, claim 6 has been canceled, claim 8 has been added and claim 1 has been amended pursuant to 37 C.F.R. 1.121. It is believed these changes have placed the pending claims in conformance with the requirements of the Office Action. At this point, applicant believes that the claims remaining in the case distinguish over the art cited and comply with the requirements of 35 U.S.C. §102, §103 and §112. As such, allowance of the claims is respectfully requested.

Respectfully submitted,

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